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RE:PODS wants to produce cleaner portable gasification system

by **Paul Monies** Published: February 11, 2016

Workers load a conveyor belt Wednesday with eastern red cedar chips to fill a prototype for the RE:POD System at Oklahoma State University. RE:POD's portable gasification system converts biomass to electricity. [Photo by Paul Monies, The Oklahoman]

STILLWATER — Converting waste to energy isn't a new idea, but one fledgling company spinning out of Oklahoma State University research hopes newly patented technology will convert enough investors to get its portable gasification system into production.

RE:POD Systems came out of research by a team led by OSU professor Raymond Huhnke into biofuels and how to make the gasification process cleaner and more efficient. The portable system takes almost any type of carbon-based waste and converts it to synthetic gas to power a generator.

Carey Warren, CEO and co-founder of RE:POD, said his company helps solve two global problems: the rising demand for electricity and what to do with trash and waste generated by everyday life.

"We create electricity from the trash that you throw out every single day," Warren said. "This is really a Swiss Army knife. It can be used at a mall, it can be used at a hospital, a factory, an ag placement like a feed lot or chicken farm."

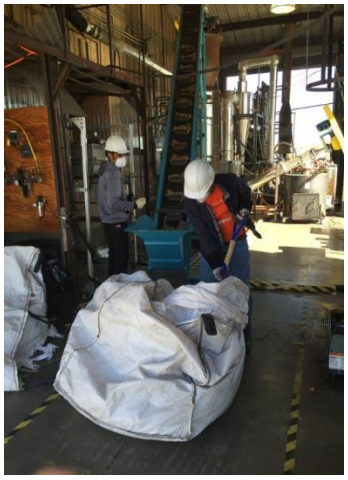
RE:POD, along with Huhnke and the OSU Research Foundation's business incubator, Cowboy Technologies LLC, held a demonstration Wednesday at OSU's Biobased Products and Energy Center. Cowboy Technologies invested $400,000 in RE:POD and owns 25 percent of the company.

As potential investors looked on, workers fed pile after pile of eastern red cedar "fluff" onto a conveyor belt and into the gasifier. A separator pulled out the useful gas, putting it through a filter to a generator. The system had enough power to generate 60 kilowatts, but used just 10 kilowatts for the demonstration to power a microwave and coffee maker. Excess gas was flared. The byproduct was a black substance called biochar, a charcoal that can be used as a soil conditioner or in a filtration system for water.

RE:POD said its system was different from other gasification units because it can accept a wide variety of waste products such as feedstock, from cardboard and switchgrass to manure, and lightly sorted municipal solid waste. The patented gasification process also eliminates more tar contaminants, lowering maintenance costs for the system.

"It takes the carbon-based material and under 1,000-degrees Celsius, separates the gases from the underlying material," Warren said. "That gas is then cooled, filtered and fed into an internal combustion engine that powers a generator."

The RE:POD system is still a prototype and hasn't yet gone into commercial production. Warren said the company has leads from retailers such as Walmart Stores Inc. It's also had meetings with large industrial companies such as Diageo and Unilever that want to meet renewable energy targets but have high electricity demands. If it can get enough investors, RE:POD hopes to manufacture the systems in Oklahoma.



"Our fervent hope is that we create the opportunity here in Oklahoma," Warren said. "It's an Oklahoma-grown technology that was fostered here and created at Oklahoma State University. Now it's commercialized here in the state of Oklahoma to be exported to the world."

The RE:POD system — Renewable Energy: Power on Demand — fits into standard shipping containers. It's self-contained and only requires a small amount of fuel — via propane or electric battery pack heater — to get the unit running. After that, it generates its own power.

Wayne and Cola Crouse, owners of Bernice Sanitation, were among the dozen or so potential investors at the demonstration. Bernice Sanitation hauls commercial and residential waste in a four-county area in northeastern Oklahoma. The Crouses were impressed with the RE:POD technology, but worried about the labor costs of sorting the trash or biomass.

"I just see a lot more labor," Cola Crouse said. "Someone has to separate and shred it and feed it. You've got to make sure there's no metal or stone. But I love the zero-footprint of this on our planet and how it's a backup on the grid."

Other potential investors at the demonstration included representatives from several Oklahoma tribes, including the Muscogee (Creek) Nation and the Choctaw Nation.

Warren and his co-founder, Brian Barger, are both OSU graduates. The company estimates the price of a commercial RE:POD unit to be from $325,000 to $499,000. Units for the military would need to have extra steel walls and a Faraday cage to protect against electromagnetic pulse dangers in the battlefield, so they would be on the higher end of the range. The company also hopes to be able to offer leasing options.

Without incentives, RE:POD said the payback on the investment could come in two years in most large U.S. markets. The company is targeting commercial, retail and industrial customers, but the system also has potential in emergency management, Warren said. It can be set up in as little as 24 hours.

"If the power goes down, we can be onsite, using the waste that's on the ground — the trash, the lumber — any kind of organic waste, and we're powering up and creating electricity for people while cleaning up the site," Warren said.

Much of the developing world still has little access to electricity or gets it from diesel-fueled generators. Market research by RE:POD puts the replacement market for similarly sized diesel generation systems at $40 billion per year.

"Developing countries that have no or limited access to electricity can utilize their local resources to actually produce electricity to cook with, to heat their homes," Huhnke said. "This is very scalable, too. We can go down in size, and we feel very confident we can go up in size."